

CLAIMS

1. Biodegradable heterophase polymeric compositions having good resistance to ageing and to low humidity conditions, comprising thermoplastic starch and a thermoplastic polymer incompatible with starch, in which starch constitutes the dispersed phase and the thermoplastic polymer constitutes the continuous phase, containing an interfacial agent selected from the following class of compounds:

- esters of polyols with mono- or polycarboxylic acids with values of the dissociation constant  $pK$  lower than 4.5 (the value relates to the  $pK$  of the first carboxyl group in the case of polycarboxylic acids), characterised by hydrophilic/lipophilic balance index values (HLB) greater than 8.

2. A composition according to claim 1, wherein in said esters of polyols the polyols contain 3 or more carbon atoms and 2 or more alcohol groups.

3. Compositions according to claim 2, in which the polyol is glycerol.

4. Compositions according to claims 2 or 3, in which the esters are monoglycerides.

5. Compositions according to any of the preceding claims 2-4, in which the ester is an ester of oxalic, malonic, succinic, adipic, glutaric, maleic, citric, tartaric, lactic, or mono-, di-, or tri-chloroacetic acid.

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6. Compositions according to claim 5, in which the ester is (on average) the monoglyceride.

7. Compositions according to any of the preceding claims 1 to 6, in which the ratio by weight between the thermoplastic starch and the thermoplastic polymer incompatible with starch is such that the starch constitutes the dispersed phase and the thermoplastic polymer constitutes the continuous phase.

8. Compositions according to any of the preceding claims 1 to 7, in which the quantities of the esters used are from 0.5 to 20% by weight relative to the total composition.

9. Compositions according to any of the preceding claims 1 to 8, comprising a plasticizer.

10. Compositions according to claim 9, in which the plasticizer is selected from polyols with 3 or more carbon atoms and with 2 or more alcohol groups, the polyols possibly being etherified or esterified.

11. Compositions according to claim 10, in which the polyol is selected from glycerol, sorbitol, etherified or esterified sorbitol, ethyleneglycol and trimethylolpropane.

12. Compositions according to any of claims 9 to 11, in which a quantity of plasticizer of from 1 to 100% by

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weight relative to the starch is used.

13. Compositions according to any of the preceding claims, in which the ester is used in a ratio of from 1:30 to 1:2.5 by weight to the starch.

14. Compositions and materials according to any of the preceding claims, in which the thermoplastic polymer is selected from aliphatic or aliphatic-aromatic polyesters obtainable by polycondensation of hydroxyacids with 2 or more carbon atoms, or from the corresponding lactones or lactides, or by a polycondensation of a diol with 1-12 carbon atoms with a dicarboxylic aliphatic acid or with mixtures thereof with dicarboxylic aromatic acids.

15. Compositions according to claim 14, in which the polymer is a poly-ε-caprolactone.

16. Films as obtainable from the compositions of any of claims 1 to 6.

17. Use of the film according to claim 16 in the manufacture of nappies, of sanitary towels, of bags, of laminated paper, of laminates and of films treated with inorganic products, such as silica and aluminium.

18. Use of the films of claim 16 in the agricultural field and for cellophaning.

19. Use of the compositions according to any of claims 1

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to 15 for the manufacture of expanded materials usable in packaging and of disposable articles.

20. A material as obtainable from heterophase compositions comprising thermoplastic starch and a thermoplastic polymer incompatible with starch, in which the starch constitutes the dispersed phase and the thermoplastic polymer constitutes the continuous phase, characterised by a microstructure of the dispersed phase in which at least 80% of the particles have dimensions smaller than 1  $\mu\text{m}$ .

21. A material according to claim 20, in which the average numeral particle size is between 0.1 and 0.5  $\mu\text{m}$ .

22. A material according to claims 20 or 21 in film form.

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